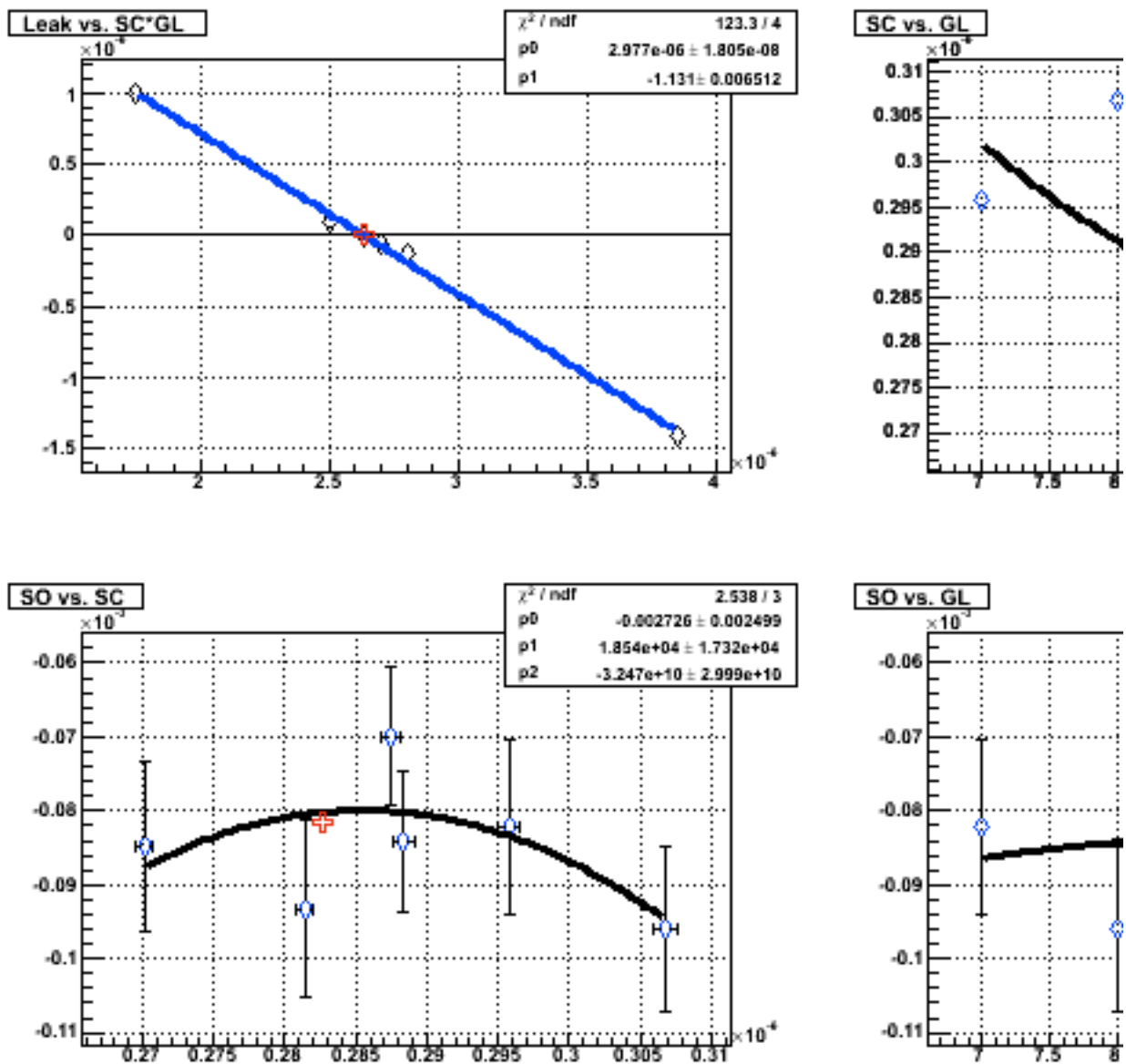# SpaceCharge + GridLeak + Padrow 13 in dAu200 Run 8

Gene Van Buren

Things look good for the calibration after 6 passes:

Doing an inspection of the residuals after corrections afthighlights a problem we've had for years: overcorrection of GridLeak. The left plot shows residuals vs. padrow and z for all sectors. The right plot is what I call the "gap", the residual at padrow 12 - padrow 14 divided by 2 (it's really the average of padrow 12 and -1*padrow 14):
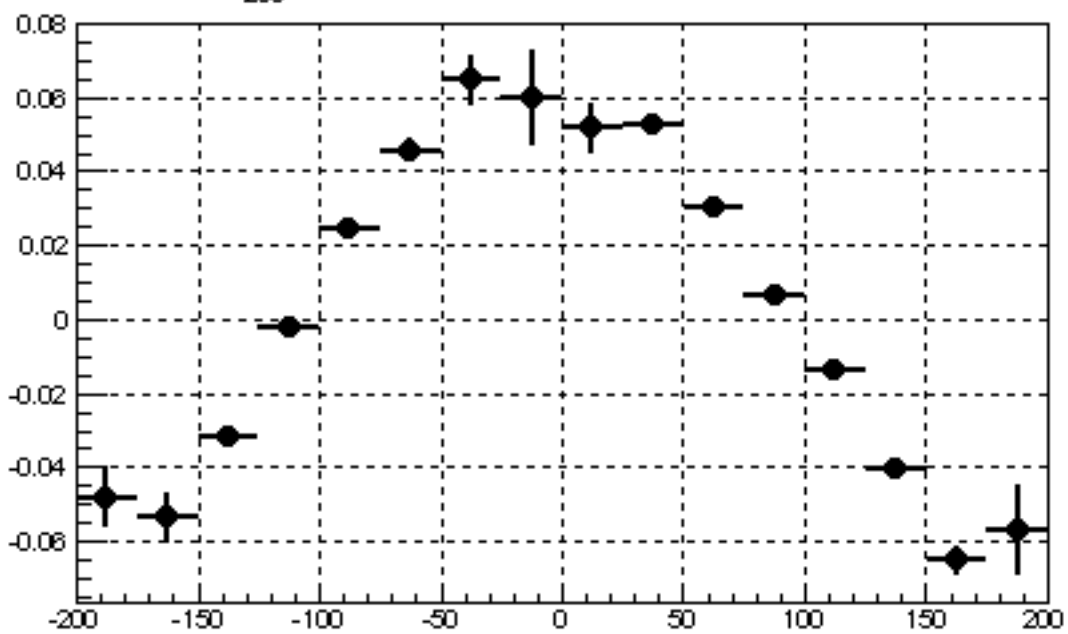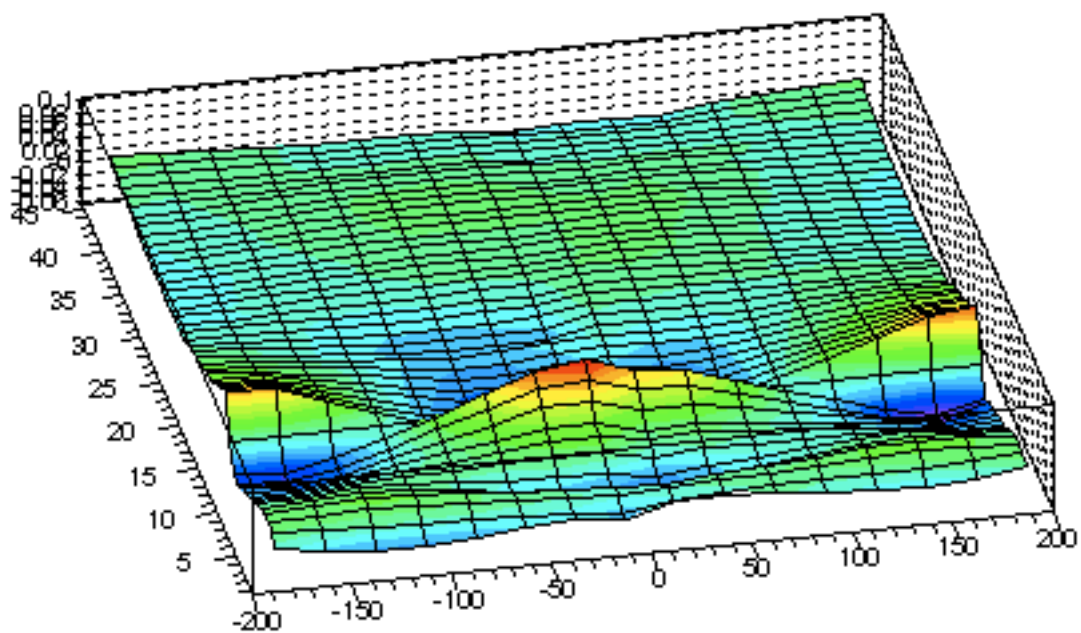
Here is the same data after only SpaceCharge correction (no GridLeak):
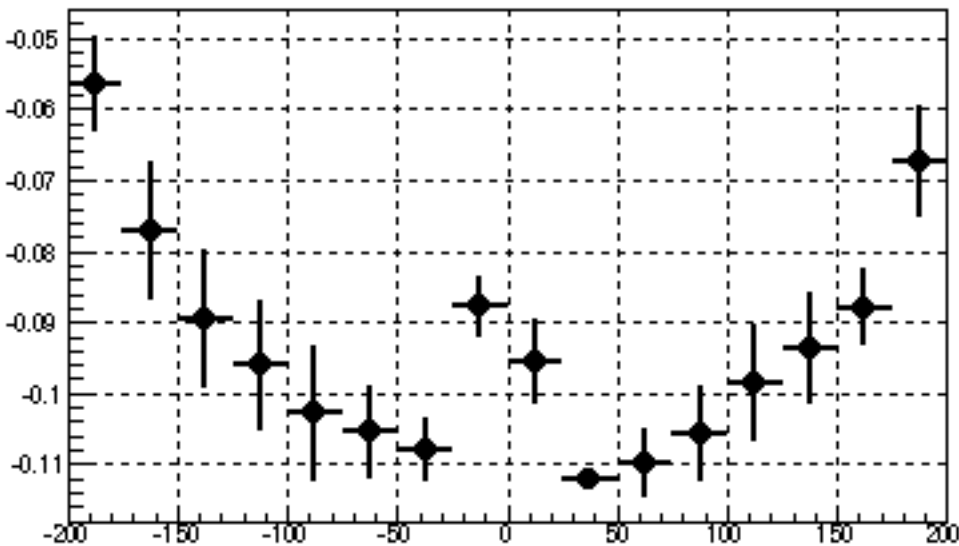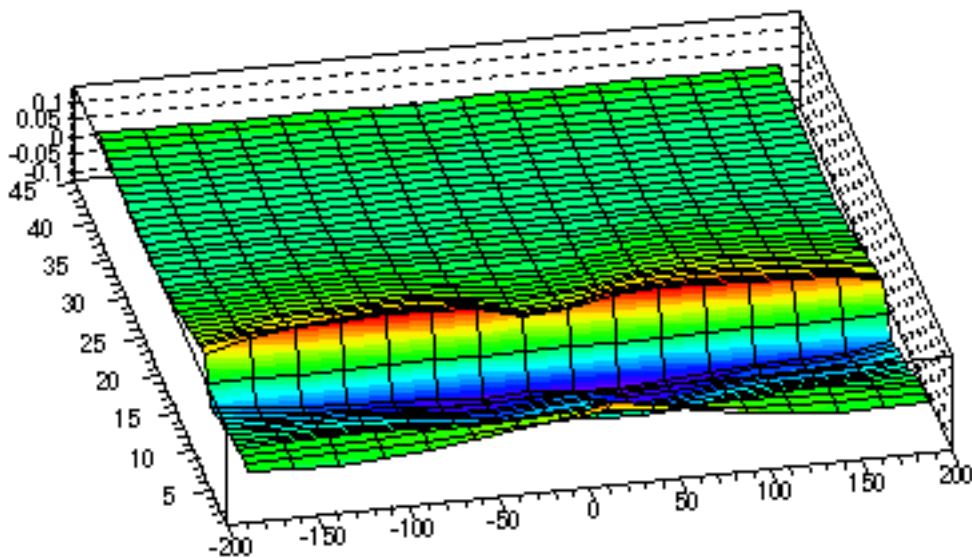
The problem is there is an offset (intercept) which is not zero. I can either correct so that the mean gap for all z is zero, or so that the dependence on z is zero:
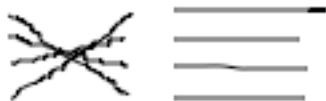

I have been doing the former for years. It suppresses the distortion for more of the TPC. But looking at that offset versus luminosity, I see that it is nicely linear (the multiple datapoints are different calibration passes from my SpaceCharge+GridLeak calibration, and they all lie on top of each other because those corrections go to zero

at the endcaps and don't affect this offset):
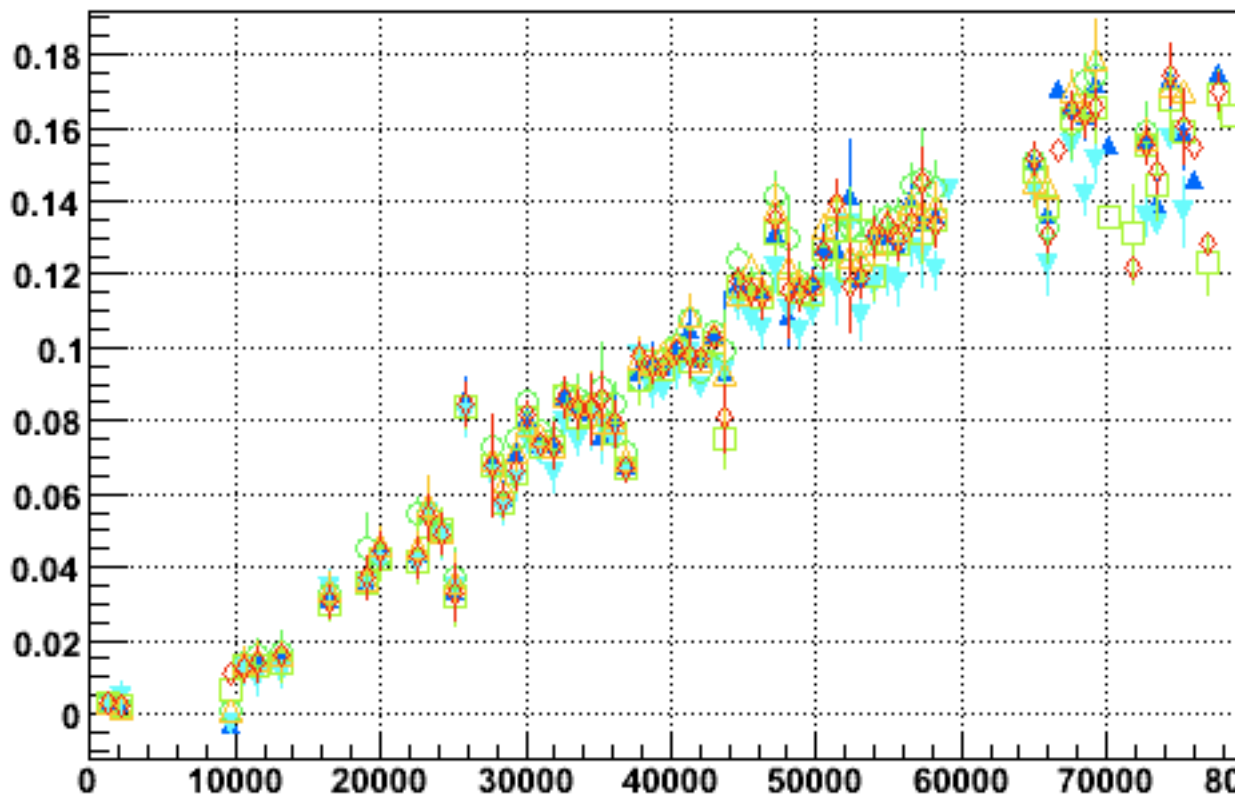
Clearly the offset is luminosity dependent.

I've been working with Jim Thomas on developing a padrow 13 correction which is luminosity dependent. Here is the distortion correction for padrow 13 as a function of radius:

R*Phi Distortions in the TPC
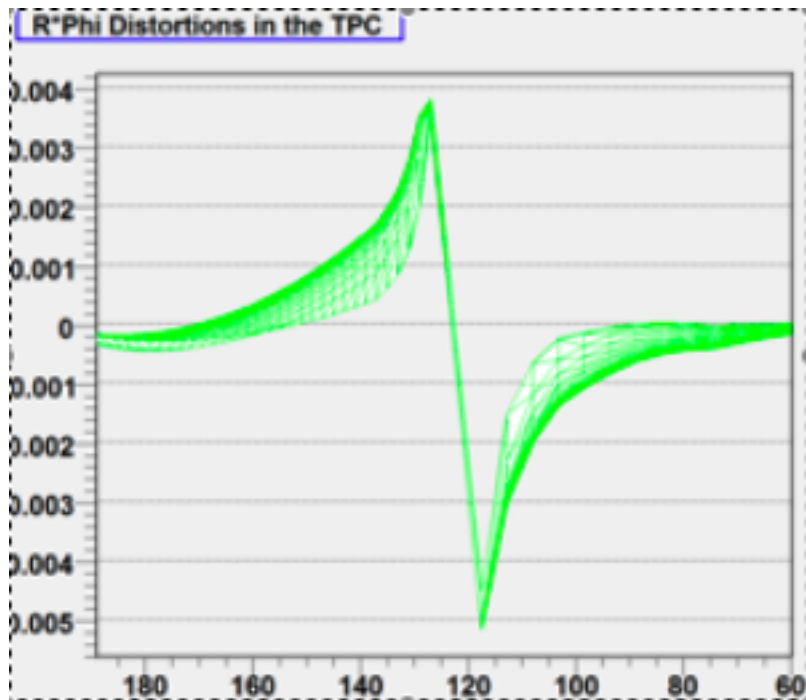
So GridLeak + padrow 13 will look something like this, with an additional parameter to tune for the dependence of the padrow 13 correction on luminosity (essentially, how it scales with SpaceCharge):

R*Phi Distortions in the TPC